

25 YEARS

What Happens When Colleges Broaden Access to Transfer-Level Courses? **Evidence from California's Community Colleges**

Technical Appendices

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Supported with funding from the California Acceleration Project and the Sutton Family Fund

Appendix A. College Profiles

In this appendix, we summarize how a group of colleges implemented placement and curricular reforms across the state in English and math. Because the increase in access at these colleges is closer to what we expect to see after full implementation, these colleges provide an early example of what we might expect as more colleges increase access.

Implementation of placement and curricular reforms in English

At the College of San Mateo, the percent of first-time English students gaining direct access to transfer-level English increased dramatically from 38% to 94% between 2015 and 2018 (Table E4, Technical Appendix E). The changes in access were primarily driven by a new multiple measures policy which placed students into the English sequence using overall high school GPA, English grades, and other standardized test scores (e.g. Accuplacer, SAT, ACT, AP). The college was already offering an English 105 course, an enhanced college composition course for students who needed additional support, particularly with critical reading skills. While the college has experienced success with the enhanced course, they feel "there is still room for growth" and recognize that their college composition courses have begun to comprise a more academically heterogeneous population. Therefore, in spring 2019, the English Department began regularly meeting in Communities of Practice to improve their teaching of composition, learn how to better integrate academic and non-academic skills (affective domain), and provide "just-in-time" remediation. For instance, one group is studying ways to improve student engagement, while another is piloting new grading practices. Starting fall 2019 the college will no longer be offering standalone remediation courses and will be looking at ways to enhance offerings in the writing center to provide additional support for students with higher needs; they will have expanded instructional and student service support (e.g. - embedded tutors; intrusive counseling); they will have also begun cohorting students participating in the Promise Program. In addition to the implementation of the Promise Scholars and AB 705, the college is also working on Guided Pathways. The college is working to ensure that these initiatives are aligned to provide students with instructional and student supports which together help to address students' needs more holistically.

Over the past several years, Moreno Valley College has experienced significant gains in the share of first-time English students starting directly in college composition—from 19% to 87% between fall 2015 and fall 2018 (Table E4, Technical Appendix E). In this timeframe, the college began to use GPA for placement into the English sequence and began phasing out the lowest levels of the standalone remedial courses, such that only the one-level-below-transfer course—in an accelerated and hybrid model—is currently being offered. Still, they found that even with this shortened English pathway, many students in the accelerated courses were writing at the level of freshman composition. This led them to investigate the possibility of offering a co-requisite. In 2018, the college began offering a linked co-requisite course taught by the same instructor that focuses on three key areas: reading skills, writing skills, and affective domain/student success awareness skills. The idea was to provide students with the academic and non-academic supports that will help them feel confident in their ability to succeed. They found that the gains in access resulted in slight declines in pass rates, but overall, throughput was much higher. Starting fall 2019, the college will no longer offer any standalone remediation and will place all students directly into a college composition course with or without support using high school GPA and the default placement rules.

Cuyamaca College was one of the first implementers of placement and co-requisite reforms in the state. Between fall 2015 and fall 2018, direct access to college composition nearly tripled, going from 31% of first-time English

students to 88% (Table E4, Technical Appendix E). The broadened access was facilitated by a move toward a disjunctive multiple measures placement process that incorporated the use of self-reported GPA and by the introduction of co-requisite English courses. In fall 2016, the college began to pilot a linked co-requisite course and by fall 18 the Accuplacer placement test had been eliminated and all students were allowed to enroll directly in college composition, some with co-requisite support. Similar to other colleges, the extra time provided by the co-requisite course is used to address students' academic and non-academic needs. There is a perception that the gains in access and success in college composition are driven by the changes in structure which eliminate exit points and the resulting change in messaging: which now says "everybody is college ready."

Solano College was also one of the first implementers of developmental English reform in the state. With the adoption of a multiple measures placement practice and a co-requisite remediation option, the college saw access to college composition increase from 33% in fall 2015 to 90% in fall 2018 (Table E4, Technical Appendix E). Early on, however, the gains in access were not as drastic because the college needed to manually clear students for enrollment based on their high school records. Institutionalizing and automating the multiple measures placement helped streamline the process and get the college to where it is now. The college supports its more academically diverse student population in completing co-requisites by addressing the affective domain, providing just-in-time remediation, and by engaging more with reading and writing through more collaborative activities and conversations. Co-requisite courses also have the support of an embedded teaching apprentice. Still, there is an interest in collaborating with adult schools to support the small share of the student population who struggles with basic literacy. As of fall 2019, the college only offers one section of remedial English; although no student is placed there, students would have the option to self-place in the remedial course; the default rules will be used to place all students into the standalone or supported college composition course.

Implementation of placement and curricular reforms in math

Cuyamaca was the first college in the state to transform its math remediation approach. In fall 2016, Cuyamaca launched its new Math Pathway program, with different math pathways for students pursuing different majors (Henson et al. 2017). After the transformation, the college began to use high school performance records together with the placement test in a disjunctive multiple measures approach. The college also eliminated traditional remedial courses below Intermediate Algebra and began allowing students to enroll in transfer-level statistics, pre-calculus and business calculus courses with co-requisite support. In the first year, direct enrollment to transfer-level math more than doubled from 26 percent to 57 percent. Cuyamaca also worked with its sister college and district on a new districtwide placement policy to resolve some operational challenges and increase access. By the fall 2018, more than three quarters of Cuyamaca's first time math students started in a transfer-level course (with or without co-requisite support). About 380 of these students successfully completed the course, which is substantially higher than the one-term throughput before the transformation started (163 completions in fall 2015). The gains in throughput can be expected to grow even further in fall 2019 as the college has refined its placement process such that students will only see placements for the math course(s) that are most relevant to their major. Also, the reduction in below-transfer-level math courses will continue, as Cuyamaca will no longer offer pre-statistics and only a small number of intermediate algebra courses (approximately 5 sections).

College of the Siskiyous also revamped their placement policies in fall 2016, permitting all students to enroll in transfer-level statistics. To support students, the college increased weekly contact hours from four hours to six by switching one lecture hour to three lab hours. The additional lab hours allowed for embedded tutoring and group-centered activities. This change in placement policies more than quadrupled the share of students enrolling directly in transfer-level math (or statistics) from 14 percent in 2015 to 65 percent in 2016 and 2017, and finally 81 percent in 2018. During this same timeframe, one-year throughput rates increased from 17 percent in 2015 to

56 percent in 2017, and one-term throughput rates from 11 percent in 2015 to 49 percent in 2018. At Siskiyous, reforms in statistics were considered to be of foremost importance because most of their students enroll in programs that do not require a transfer level math course beyond statistics or college algebra. For most students statistics is the transfer level math they choose, with 67 percent of all first-time math students starting in statistics in fall 2018.

Los Medanos was the third college that modified its placement policies and curricular offerings in 2016. At Los Medanos, pre-requisite remediation has been decreasing over time while transfer-level offerings have been on the rise as the college has refined its placement policies to incorporate self-reported GPA, prior coursework, and program of study. Specifically, the share of students enrolling directly in transfer-level math more than doubled (from 35 percent in 2015 to 74 percent in 2018). During this same timeframe, one-year throughput rates increased from 35 percent in 2015 to 49 percent in 2017, and one-term throughput rates from 26 percent in 2015 to 47 percent in 2018. Most of the gains reflect increased access to statistics (55 percent of first-time students started in statistics). In addition, placement policies have changed, such that students with a high school GPA of 2.8 and who have completed beginning algebra qualify for standalone statistics and all students qualify for statistics with co-requisite support. Math faculty noted that being able to complete the math sequence faster makes the statistics opt to take the co-requisite "because [they] are a little afraid" of transfer-level math—an example of where students may be prone to underplacement if given the option.

Beginning in fall 2018, Foothill started allowing students to self-place into any entry-level transferable math course, leading 91 percent of first-time math students to start in a transfer-level course up from 57 percent in fall 2017. This change meant an increase of 90 percent in the number of first-time math students enrolling in statistics (from 224 to 425 students), and a 53 percent increase in pre-calculus (from 116 to 177). To support students in these courses, Foothill provides peer tutors and supplemental instructors for statistics, and co-requisite support for pre-calculus. Course success rates suffered an 8-percentage point decline in statistics and 4-preentage points in pre-calculus. But because of the large increases in access, the number of completions were up by 30 percent and 28 percent respectively. Overall, one-term throughput increased from 29 percent in 2017 to 52 percent in 2018.

At De Anza, 76 percent of first-time math students started in a transfer-level course, a 40-percentage point increase from the previous fall. Despite this significant increase in access, success rates in the statistics course remained stable, leading to an increase in completions of about 400 students. De Anza did not offer co-requisite support. Overall, one-term throughput increased from 44 percent in 2017 to 62 percent in 2018.

Appendix B. Additional insights from the interviews

Scale of co-requisite offerings: The number of co-requisite sections can be limited because of supply or demand constraints. For example, at Fullerton College enhanced course offerings had been partly limited because students wanting to enroll needed to specifically request the course and because they were offered as pilot shadow courses while they sought to secure IGETC (Intersegmental General Education Transfer Curriculum) articulation. The course received IGETC approval in May 2019 and beginning fall 2019, Fullerton will offer the enhanced course for 5 units. Starting fall 2019, students will be free to choose between the regular college composition course and the enhanced course will not be required for certain GPA bands, students will be encouraged to learn about their options, talk to a counselor and decide which course is best for

them. Given these changes, we can expect the enrollment in the Fullerton College enhanced course to increase significantly in fall 2019. On the other hand, Skyline College faced unexpectedly low student demand when their enhanced English course was first offered (pre-2015). This happened because the first version of the enhanced course was identical to the regular English composition course, except that it was 5 credits instead of 3. The course was dropped because the college "didn't want students to have to pay for credits that weren't really serving them." When Skyline College decided to bring that course back, the new enhanced course was redesigned so that the extra time could be used to incorporate an affective domain component and embedded student support. Finally, at several colleges, the growth of co-requisite offerings has been limited as a result of the placement results themselves. In particular, we learned that placements in standalone transfer-level English were actually higher than expected because of students' strong grades in high school meant that co-requisite offerings were not necessary.

Non-credit coursework: As colleges spoke of significantly reducing or eliminating remediation, discussions of the use of non-credit courses emerged.¹ Colleges described using non-credit coursework in two ways: (1) to replace the lowest levels of remedial sequences and (2) to mirror the remedial course sequence. Both approaches focus on students who faculty believe need more than one year to reach transfer-level English and math. Math departments for example spoke of turning arithmetic and pre-algebra courses into non-credit courses. At Los Medanos College we learned that there have also been discussions of making the co-requisite non-credit. One of the benefits of offering courses as non-credit is that students do not need to worry about the grades or tuition. However, if a student needs a certain number of units for a full load, taking non-credit courses would mean that they would need to take another credit course to meet this requirement. Still, it must be recognized that with the open access mission being central to community colleges, providing basic skills courses using a non-credit option could be helpful for students who do not intend to obtain a degree or transfer to a four-year school.²

Appendix C. Data and Methods

Our quantitative approach utilizes student-level longitudinal data from the California Community College Chancellor's Office Management Information System (COMIS). The dataset includes students enrolled across the 114 community colleges that comprise the California Community College system, and includes information on student characteristics (race/ethnicity, gender, low income status), course-taking behavior, course elements (title of course, levels below transfer level, credit status, transfer status and minimum/maximum number of credits), and student outcomes (grades, and credits earned). Data was also collected from an exhaustive scan of the latest college catalogs, websites, and other institutional documents. This process allowed us to identify which colleges were offering co-requisite support.

¹ One college also mentioned the possibility of working with adult schools to better serve students with lower literacy levels.

² In our sample, about 75 percent of students who take math and English courses in the CCC identify their educational goal as a degree or transfer—this means that up to one-quarter of this group could conceivably benefit from non-credit basic skills.

We are including in our analysis 109 colleges for English and 106 for math. For a small group of colleges we found some inconsistencies between the MIS data and what we saw in college's class schedules. We excluded the following colleges from the analysis.

English: L.A. Harbor, West L.A., L.A Trade-Tech, Southwest L.A., and Santa Monica.

Math: L.A. Trade-Tech, Southwest L.A., West L.A., L.A. City, L.A. Harbor, East L.A., Mission, and Sequoias.

Worth noting that this is a system-wide analysis, we are including information for all colleges with valid information and calculating the same metric across colleges to identifying the group of colleges that saw the largest increases in access to transfer-level English and math courses. We first, created cohorts of students based on the term in which they took their first credit English/math course. Then, we calculated the share of first-time English/math students enrolling directly in college composition/ transfer-level math. Next, we used two criteria to identify colleges that saw the largest increases in access to transfer-level courses. Specifically, we identify colleges that saw an <u>annual increase</u> of more than 25 percent points in the share of first-time English/math students starting directly in college composition/transfer-level math courses at some point between fall 2016 and fall 2018. Because this criterion misses colleges where the change happened more gradually, we also identified colleges that registered a <u>cumulative increase</u> of 35 percentage points or higher between 2015 and 2018. It is safe to assume that these colleges engaged, in some degree or another, in placement reform.

To inform our quantitative findings, we conducted semi-structured interviews with faculty, department chairs, division deans, and researchers at 19 colleges in the group that significantly broadened access to transfer-level courses and/or offered co-requisite support at scale. Specifically, during the spring 2019, we interviewed 24 individuals that included 15 faculty, 7 division deans or department chairs, and 2 institutional researchers. Seventeen of the twenty-four individuals were involved with reforms in English and seven were involved with reforms in math. All 19 colleges were using multiple measures for placement and either offering or planning to offer co-requisite models. We spoke with each interviewee for about one hour over the phone. Interviewees were asked a variety of questions pertaining to their background; the math/English course sequence offerings and motivation for offering certain sequence structures; how students assess, place and enroll into corequisite and transfer-level math and English courses; how and why co-requisite courses are structured in certain ways; what is the pedagogy an curriculum like in co-requisite courses; key factors helping or hindering student success and equitable outcomes; the type of professional development provided; funding used to support reform efforts; what will placement and developmental education offerings look like in fall 2019 in response to AB 705; and how they see developmental education reforms aligning (or not) to guided pathways efforts. Open-ended questions were used to facilitate the collection of information based on questions that do not restrict the participants' opinions (Creswell and Plano Clark 2011). The data collection and data analysis were carried out simultaneously to avoid the collection of repetitive and unfocused data (Merriam 1998). Specifically, after each interview was conducted, researchers debriefed, reviewed detailed data notes and audio recordings, and kept notes to capture reflections, emerging themes, and points that needed to be pursued further. This process of review and reflection informed all subsequent interviews. In this manner, data collected from each interview was continuously assessed and informed future interviews until data collection was complete. The data was also organized and coded on a secure spreadsheet. This approach was used to come up with a number of patterns and themes.

Appendix D. Caveats and Limitations

- 1. The MIS database do not include data on placement, so we are unable to identify who was referred to developmental education or to transfer-level with or without co-requisite support. Neither do we do have information of students' high school performance measures (i.e. course taking, grades or GPA). Our analysis is based exclusively on course-taking behavior.
- 2. A critical question is whether students who start in transfer-level courses with co-requisite support have better outcomes than those who start in traditional developmental sequences. Since we do not have high school records or assessment and placement information, we cannot directly assess whether prior academic ability drives our results.
- 3. Even though our results do not include statistical controls, we believe our analysis uses the right comparison groups and counterfactuals. The evidence presented in this report is consistent or suggestive of a positive and strong relationship between increases in access and increases in throughput; however, it is not sufficient to infer causality.
- 4. The accuracy of our results relies on the accuracy with which colleges report their information to the Chancellor's Office. In a small group of colleges, we identified inconsistencies in terms of their developmental education offerings between what it was in the MIS data and the information presented in college catalogues and class schedules (i.e., missing developmental courses). We excluded those colleges from our analysis. While we used various approaches to identify colleges with inconsistent data, it is possible that we missed colleges where the data discrepancies were not as stark.
- 5. In our calculations of access in math, we use any math or statistics courses flagged as transferable to either a CSU or both UC and CSU, including courses that only transfer as electives and do not satisfy any general education or major requirement. Ideally, we would only include those that satisfy general education or major requirements the same way we do with college composition courses. Also, we are separating statistics and other transferable math courses. Future analysis will separate transfer-level math courses between Statistics and Liberal Arts Math (SLAM) versus Business, Science, Technology, Engineering and Math (BSTEM), which is a better comparison because it aligns with the math pathways that are increasingly being used at colleges across the state.
- 6. Many colleges in our group that significantly broadened access offered some form of concurrent support to help students to succeed under their new placement systems. Our focus in this report is on co-requisite models because we are not yet able to consistently identify and measure participation in other forms of concurrent support (e.g., writing labs, tutoring centers, supplemental instruction).
- 7. We observe the year in which colleges saw a big jump in access; however, we do not have information on exactly when most colleges began to implement their placement policies. Similarly, we do not have complete details on the specific placement changes adopted (i.e., placement measures used, rules, etc.).
- 8. This analysis sheds light on what happens when colleges significantly broaden access to transfer-level courses. However, given the fact that the state is moving from voluntary pockets of locally lead reforms to statewide mandated adoption, what will happen after AB 705 full implementation is uncharted territory. The evidence presented in this report will be an important baseline for future examinations.

Appendix E. Table and Figures

TABLE E1

List of colleges that significantly broadened access to college composition and/or implemented co-requisite support

	Year big jump in access		Year big jump in access
COALINGA	2016	FOOTHILL	2018
LAS POSITAS	2016	FULLERTON	2018
MT. SAN JACINTO	2016	GROSSMONT	2018
PORTERVILLE	2016	MT. SAN ANTONIO	2018
SAN MATEO	2016	SACRAMENTO CITY	2018
SKYLINE	2016	TAFT	2018
SOLANO	2016	WOODLAND	2018
LOS MEDANOS	2017	YUBA	2018
MERCED	2017	COSUMNES RIVER	Gradual
MORENO VALLEY	2017	IRVINE VALLEY	Gradual
NORCO	2017	L.A. CITY	Gradual
REEDLEY	2017	SAN DIEGO CITY	Gradual
RIVERSIDE	2017	SAN DIEGO MESA	Gradual
AMERICAN RIVER	2018	SOUTHWESTERN	Gradual
BAKERSFIELD	2018	VENTURA	Gradual
CABRILLO	2018		
CANYONS	2018		
CERRITOS	2018		
CITRUS	2018		
COPPER MOUNTAIN	2018		
CUYAMACA	2018		
DE ANZA	2018		
EAST L.A.	2018		
FOLSOM LAKE	2018		

Share of first-time English students enrolling directly in college composition – colleges that significantly broadened access versus rest of colleges

	Colleges that si	gnificantly broade	ened access (39)	Rest of colleges (70)					
	First-time English students	First-time English students going directly into college composition	Share going into college composition (%)	First-time English students	First-time English students going directly into college composition	Share going into college composition (%)			
2015	60,036	19,393	32	93,099	38,884	42			
2016	60,819	24,563	40	94,022	41,897	45			
2017	61,393	31,414	51	94,555	48,309	51			
2018	60,405	47,642	79	94,520	57,961	61			
Absolute Change 2015-18	369	28,249	47	1,421	19,077	20			

TABLE E3

Racial/ethnic distribution of first-time English students – colleges that significantly broadened access versus rest of colleges (%)

		2015		2018				
	Colleges that significantly broadened access	Rest of Difference colleges (pp)		Colleges that significantly broadened access	Rest of colleges	Difference (pp)		
Latino	55	50	-5	56	53	-2		
White	21	26	5	20	23	3		
Asian American	13	11	-2	12	11	-1		
African American	5	5	1	5	5	0		
Other	6	7	1	8	7	0		
Total	100	100	0	100	100	0		

Direct access to college composition among first-time English students and one-term throughput rate

	Share	going dir	ectly in co (%)	ollege cor	nposition	One-term throughput rate (%)				
College Name	2015	2016	2017	2018	Change 2015-18 (pp)	2015	2016	2017	2018	Change 2015-18 (pp)
MT. SAN ANTONIO	17	15	22	95	79	12	10	14	61	49
MORENO VALLEY	19	32	67	87	68	14	23	42	55	41
LOS MEDANOS	24	29	87	88	64	19	23	62	62	43
MT. SAN JACINTO	25	52	60	83	58	19	37	44	53	34
CUYAMACA	31	42	60	88	57	25	35	48	68	43
NORCO	27	36	69	84	57	20	25	45	53	32
SOLANO	33	67	81	90	56	26	49	59	66	41
SAN MATEO	38	81	91	94	56	32	59	67	68	36
CERRITOS	20	30	38	75	55	15	21	28	51	36
CITRUS	48	47	49	100	52	35	35	35	67	33
FOLSOM LAKE	32	35	34	84	51	24	29	26	62	38
RIVERSIDE	29	34	61	79	49	19	23	41	46	27
CABRILLO	39	41	43	88	49	29	32	33	64	35
SAN DIEGO MESA	30	47	64	78	48	25	36	45	59	34
AMERICAN RIVER	37	38	37	85	48	26	26	27	57	30
PORTERVILLE	14	39	43	61	47	11	28	32	47	36
SKYLINE	49	76	92	95	46	39	57	64	67	28
EAST L.A.	23	25	32	67	44	14	16	21	39	25
SACRAMENTO CITY	32	35	46	76	43	21	24	30	54	33
IRVINE VALLEY	38	52	63	81	43	31	43	54	67	35
SOUTHWESTERN	30	39	52	73	43	24	31	37	55	31
COALINGA	44	77	80	87	43	26	52	59	66	40
GROSSMONT	35	38	41	77	42	27	28	32	57	31
L.A. CITY	18	21	41	57	39	13	16	30	38	25
CANYONS	40	37	41	78	38	33	29	35	59	27
MERCED	35	37	66	73	38	23	24	39	44	21
FULLERTON	38	44	50	77	38	29	33	39	55	26
VENTURA	43	51	68	81	38	34	42	52	59	25
SAN DIEGO CITY	22	24	35	59	37	17	21	30	44	28
WOODLAND	28	31	26	65	37	19	21	19	48	29
LAS POSITAS	44	71	77	81	37	36	57	59	65	29
REEDLEY	21	21	52	58	37	13	16	31	35	22
TAFT	38	39	47	75	37	26	28	35	46	20
COSUMNES RIVER	49	55	69	85	36	31	39	49	60	29
BAKERSFIELD	45	58	52	81	35	28	32	32	35	7
L.A. VALLEY	28	35	57	63	34	21	27	41	46	25
SAN FRANCISCO CITY	20	30	45	53	34	15	23	31	37	21
SISKIYOUS	48	50	67	81	33	36	32	50	54	19
MODESTO	35	34	49	68	33	23	24	33	42	19

	Share	going dir	ectly in co (%)	ollege cor	nposition	One-term throughput rate (%)				
College Name	2015	2016	2017	2018	Change 2015-18 (pp)	2015	2016	2017	2018	Change 2015-18 (pp)
FOOTHILL	60	54	56	93	33	47	43	45	73	27
PASADENA CITY	43	40	56	75	32	35	33	42	57	22
DE ANZA	31	35	36	64	32	28	29	31	55	27
SAN JOAQUIN DELTA	42	42	65	74	32	27	28	43	47	20
DIABLO VALLEY	30	38	52	61	31	25	32	44	51	26
GLENDALE	56	56	65	87	31	43	47	51	66	23
REDWOODS	43	48	51	74	30	32	31	32	44	13
COLUMBIA	39	50	56	70	30	30	41	42	46	16
HARTNELL	31	36	43	61	30	24	25	30	40	16
PALOMAR	44	46	57	74	30	35	34	44	53	18
FRESNO CITY	31	33	51	61	29	21	22	33	38	17
SAN DIEGO MIRAMAR	31	46	47	60	29	24	37	41	53	29
CLOVIS	42	41	60	71	29	29	34	45	53	25
MARIN	32	34	42	61	28	21	26	32	43	22
CANADA	54	64	80	83	28	40	51	52	55	15
CYPRESS	33	33	45	61	28	25	25	37	47	22
COPPER MOUNTAIN	36	35	32	63	27	27	34	28	51	24
EVERGREEN VALLEY	28	32	44	56	27	19	24	33	43	23
ALLAN HANCOCK	46	48	69	73	27	32	37	46	50	18
GOLDEN WEST	46	54	62	72	27	34	40	49	56	22
CONTRA COSTA	28	33	49	54	26	22	26	34	33	11
GAVILAN	40	43	50	66	26	24	23	31	40	16
OXNARD	49	51	63	75	26	40	39	44	54	14
YUBA	38	34	34	64	25	28	26	23	46	18
BUTTE	55	56	72	80	25	36	39	49	67	31
BARSTOW	21	32	30	46	24	18	26	24	35	17
SADDLEBACK	40	38	41	64	24	35	32	34	55	20
IMPERIAL VALLEY	24	36	33	47	23	14	23	21	35	21
RIO HONDO	46	61	66	69	23	32	42	48	42	10
CHAFFEY	40	41	43	63	23	29	27	30	45	16
L.A. PIERCE	18	17	34	41	23	15	12	26	30	16
SANTA BARBARA CITY	59	63	63	82	23	49	52	52	61	12
FEATHER RIVER	57	53	72	79	22	45	42	55	61	16
SANTA ANA	44	53	56	65	21	31	33	33	38	7
OHLONE	39	38	54	59	20	28	30	43	49	21
LANEY	44	54	51	63	19	31	38	38	45	14
ALAMEDA	56	54	57	74	19	33	40	37	47	14
SIERRA	58	69	75	76	18	45	53	57	56	11
LEMOORE	67	74	78	85	18	47	54	56	56	9
CERRO COSO	27	36	44	44	17	18	22	30	29	11
LAKE TAHOE	50	51	67	67	17	33	43	50	52	19

	Share	Share going directly in college composition (%)					One-term throughput rate (%)				
College Name	2015	2016	2017	2018	Change 2015-18 (pp)	2015	2016	2017	2018	Change 2015-18 (pp)	
MIRA COSTA	70	76	85	86	17	56	59	61	64	8	
SHASTA	61	67	69	78	17	45	47	44	51	5	
ORANGE COAST	58	58	59	74	16	42	41	43	51	10	
CUESTA	65	66	68	80	16	46	46	50	57	10	
SANTIAGO CANYON	73	74	79	88	15	56	51	57	61	5	
LONG BEACH CITY	25	29	30	40	14	18	20	20	25	8	
MERRITT	45	47	39	59	14	24	28	24	41	17	
DESERT	30	33	34	44	13	23	26	23	30	7	
SAN JOSE CITY	37	44	46	50	13	27	34	36	34	8	
COASTLINE	67	65	62	79	12	52	53	53	64	11	
EL CAMINO	37	37	38	50	12	30	30	31	40	10	
CRAFTON HILLS	37	45	47	48	11	27	34	35	37	10	
LASSEN	42	45	47	53	10	36	35	40	42	7	
L.A. MISSION	26	26	32	34	8	18	16	21	24	6	
COMPTON	15	19	17	23	8	9	13	11	13	4	
MOORPARK	78	80	83	85	7	64	65	65	66	2	
CHABOT	35	40	41	41	6	26	30	29	32	6	
PALO VERDE	33	27	27	39	6	21	16	17	22	1	
SANTA ROSA	51	52	53	54	2	39	39	40	41	3	
MONTEREY	30	28	28	32	2	23	21	20	23	0	
NAPA VALLEY	24	27	23	26	2	19	21	18	21	2	
MENDOCINO	39	36	35	41	2	31	28	28	33	2	
WEST VALLEY	48	52	50	49	1	32	40	36	40	8	
ANTELOPE VALLEY	45	52	37	46	1	32	36	26	35	3	
MISSION	42	51	32	42	0	27	41	26	35	8	
SEQUOIAS	41	36	38	40	0	24	23	24	27	3	
SAN BERNARDINO	25	21	25	23	-2	14	14	14	14	1	
BERKELEY CITY	79	77	73	77	-2	54	53	53	58	4	
VICTOR VALLEY	23	22	19	17	-5	16	17	14	13	-3	
Total	38	43	51	68	30	28	32	37	48	20	

FIGURE E1

Enrollment in college composition versus course success rates



TABLE E5

Share of first-time English students enrolling directly in college composition by race/ethnicity

	College broad	es that signi dened acces	ficantly s (39)	Rest of colleges (70)			
	2015	2018	Change (pp)	2015	2018	Change (pp)	
Access (%)							
Latino	26	77	51	33	55	21	
White	46	84	38	58	75	16	
Asian American	38	82	44	46	70	24	
African American	22	73	51	26	45	19	
Other	38	80	41	23	54	31	
Total	32	79	47	42	61	20	
Difference in access (pp)							
White-Latino gap	20	7	-13	25	20	-5	
White-African American gap	24	11	-13	33	30	-3	
White-Asian American gap	8	2	-6	13	5	-8	

One-term throughput rate by race/ethnicity

	Colleg	es that signif badened acco	ficantly ess	Rest of colleges			
	2015	2018	Change (pp)	2015	2018	Change (pp)	
Throughput rate (%)							
Latino	18	49	31	23	37	14	
White	36	63	28	46	58	13	
Asian American	32	66	34	37	57	20	
African American	15	42	27	16	28	12	
Total	24	54	30	31	44	13	
Difference in throughput (pp)							
White-Latino gap	18	14	-3	23	22	-1	
White- African American gap	21	21	1	29	30	1	
White-Asian American gap	3	-3	-6	8	1	-7	

FIGURE E2

Annual change in the number of developmental education English sections offered



List of colleges that significantly broadened access to transfer-level math

CUYAMACA	2016
LOS MEDANOS	2016
SISKIYOUS	2016
MORENO VALLEY	2017
NORCO	2017
RIVERSIDE	2017
ALAMEDA	2018
CITRUS	2018
COLUMBIA	2018
DE ANZA	2018
FOOTHILL	2018
HARTNELL	2018
MT. SAN JACINTO	2018
REDWOODS	2018
CRAFTON HILLS	Gradual
PASADENA CITY	Gradual

Share of first-time math students enrolling directly in transfer-level, colleges that significantly broadened access versus rest of colleges

	Colleges th	at significantly bro (16)	adened access	Rest of colleges (90)					
	First-time math students	First-time math students starting in transfer-math	Share going directly into transfer math (%)	Share going directly into transfer math (%)		Share going directly into transfer math (%)			
2015	21,932	4,979	23	132,519	35,014	26			
2016	21,108	5,624	27	132,319	37,496	28			
2017	21,835	8,259	38	133,016	42,489	32			
2018	21,076	12,761	61	128,485	51,897	40			
Absolute change 2015-18	-856	7.782	38	-4.034	16.883	14			

TABLE E9

Racial and ethnic distribution of first-time math students, colleges that significantly broadened access versus rest of colleges

		2015		2018					
	Colleges that significantly Rest of broadened colleges access		Difference (pp)	Colleges that significantly broadened access	Rest of colleges	Difference (pp)			
Latino	51	51	0	49	50	1			
White	24	21	-2	26	22	-4			
Asian American	13	17	4	12	17	4			
African American	5	5	0	5	5	0			
Other	8	5	-2	7	7	0			
Total	100	100	0	100	100	0			

Direct access to transfer-level math among first-time math students and one-term throughput rate

	Share	going dire	ectly into (%)	transfer-l	evel math		One-term	throughp	out rate (%	6)
College Name	2015	2016	2017	2018	Change 2015-18 (pp)	2015	2016	2017	2018	Change 2015-18 (pp)
SISKIYOUS	14	65	65	81	67	11	50	44	49	37
CUYAMACA	26	57	64	78	52	19	40	45	56	37
NORCO	10	14	41	55	46	8	9	23	31	24
RIVERSIDE	10	12	42	53	43	6	6	15	18	12
DE ANZA	33	33	36	76	42	27	25	29	52	25
CRAFTON HILLS	21	27	42	63	42	15	16	27	34	19
MORENO VALLEY	5	9	41	47	42	3	4	9	12	9
LOS MEDANOS	35	56	65	74	39	26	39	40	47	21
CITRUS	21	18	23	59	38	13	12	15	33	20
PASADENA CITY	24	27	39	61	37	18	21	27	36	18
SKYLINE	22	35	51	58	37	15	24	34	43	28
COLUMBIA	19	19	21	52	33	13	16	18	35	22
HARTNELL	12	17	17	45	33	10	15	13	31	21
MT. SAN JACINTO	16	18	19	47	31	12	14	14	24	12
FOOTHILL	61	56	57	91	31	42	40	44	62	21
L.A. MISSION	13	15	33	42	30	7	6	14	21	13
ALAMEDA	28	35	31	56	27	20	25	19	37	17
BARSTOW	4	14	18	31	27	1	12	14	22	21
CUESTA	31	30	36	58	27	19	19	21	35	16
REDWOODS	31	29	27	57	26	20	16	16	34	14
CANYONS	23	41	45	48	26	18	30	33	36	18
PALOMAR	23	23	42	49	26	14	14	23	26	12
SOUTHWESTERN	11	14	19	36	26	6	8	10	20	14
GROSSMONT	27	33	36	51	25	16	21	21	30	14
GAVILAN	14	20	22	39	24	9	14	16	27	18
SIERRA	37	48	55	61	24	26	30	35	37	11
SACRAMENTO CITY	10	10	9	34	23	7	6	6	20	13
MIRA COSTA	41	44	53	64	23	28	32	35	44	16
CABRILLO	25	23	25	48	23	15	14	15	25	10
TAFT	21	21	22	43	22	14	14	13	23	9
COALINGA	13	21	25	36	22	7	10	14	26	20
MODESTO	8	9	11	30	22	6	7	6	18	12
OHLONE	20	22	27	41	22	17	20	22	36	19
EVERGREEN VALLEY	20	21	30	41	21	13	15	19	25	11
GLENDALE	30	32	38	50	21	17	22	24	25	8
LAS POSITAS	32	33	37	52	21	20	22	25	33	14
REEDLEY	18	17	33	38	21	13	12	22	23	9
L.A. VALLEY	10	23	30	31	21	5	10	13	16	11

	Share going directly into transfer-level math (%)				One-term throughput rate (%)					
College Name	2015	2016	2017	2018	Change 2015-18 (pp)	2015	2016	2017	2018	Change 2015-18 (pp)
FOLSOM LAKE	25	25	25	46	20	18	18	18	34	16
BUTTE	26	25	35	45	20	17	18	22	32	15
YUBA	5	6	7	24	19	3	3	7	13	10
SANTIAGO CANYON	37	38	44	56	19	25	22	24	31	5
LONG BEACH CITY	19	21	22	37	19	9	12	11	16	6
RIO HONDO	10	19	25	28	19	6	8	11	14	8
OXNARD	21	22	29	39	18	14	16	19	26	11
AMERICAN RIVER	19	21	13	37	18	14	15	9	23	9
CERRITOS	15	17	18	32	17	7	10	9	17	10
BAKERSFIELD	18	20	26	35	17	11	13	15	17	6
SAN MATEO	38	46	50	55	17	25	30	34	35	9
VICTOR VALLEY	6	6	10	22	16	4	5	6	11	7
LAKE TAHOE	15	9	20	30	16	8	6	10	19	11
L.A. PIERCE	25	24	39	40	15	17	16	21	27	10
ALLAN HANCOCK	19	22	28	34	15	15	18	19	22	7
VENTURA	34	37	41	49	15	23	27	29	34	11
PORTERVILLE	23	28	34	38	15	18	17	20	26	8
DESERT	21	19	20	36	15	12	11	10	19	7
MONTEREY	17	17	20	32	14	13	14	12	21	8
SAN JOSE CITY	21	23	31	36	14	13	14	19	20	7
SAN DIEGO MESA	47	47	48	61	14	30	32	30	37	8
COASTLINE	31	28	29	45	14	18	14	15	21	3
SAN DIEGO MIRAMAR	43	48	52	57	14	33	35	39	42	9
WOODLAND	12	8	15	26	14	6	4	10	11	5
LASSEN	7	15	23	20	14	5	15	18	11	6
FRESNO CITY	26	30	40	40	14	14	19	21	19	5
SOLANO	36	38	37	50	14	21	21	22	30	10
SANTA ANA	30	36	37	43	13	19	18	18	18	-2
MT. SAN ANTONIO	34	36	32	47	13	22	21	19	23	1
MERCED	21	23	23	34	13	14	16	12	20	6
PALO VERDE	5	7	8	17	12	2	4	5	9	8
EL CAMINO	16	16	20	28	12	12	11	13	17	5
LEMOORE	21	13	18	33	12	13	9	12	21	8
IRVINE VALLEY	48	46	57	60	11	33	31	37	41	8
СНАВОТ	29	26	32	40	11	17	14	19	24	7
LANEY	30	32	38	41	11	23	20	28	27	4
SADDLEBACK	33	26	29	44	11	19	15	19	26	7
MOORPARK	40	41	40	50	11	26	24	27	29	3
NAPA VALLEY	28	33	32	38	10	21	25	26	28	7
SHASTA	35	35	46	45	10	22	23	30	28	6

	Share going directly into transfer-level math (%)				One-term throughput rate (%)					
College Name	2015	2016	2017	2018	Change 2015-18 (pp)	2015	2016	2017	2018	Change 2015-18 (pp)
FEATHER RIVER	32	32	29	42	10	29	30	26	23	-6
GOLDEN WEST	38	36	46	47	9	21	21	26	32	11
CONTRA COSTA	35	33	44	44	9	24	22	26	28	4
BERKELEY CITY	40	44	44	49	9	23	28	27	30	7
FULLERTON	41	44	44	50	9	24	26	24	29	5
CLOVIS	43	46	47	52	9	32	35	34	38	6
SAN FRANCISCO CITY	35	37	39	43	9	28	26	28	29	1
SAN JOAQUIN DELTA	14	13	23	22	9	9	9	15	13	4
DIABLO VALLEY	55	56	60	63	8	37	38	39	41	4
MERRITT	17	20	17	25	8	11	13	12	16	4
CYPRESS	28	29	32	36	8	16	19	20	21	5
CANADA	38	42	47	46	8	25	31	34	32	7
ORANGE COAST	42	38	40	50	8	27	23	26	33	6
COPPER MOUNTAIN	16	21	18	24	7	15	20	15	22	8
SANTA BARBARA CITY	47	58	57	54	7	36	45	45	40	5
CERRO COSO	15	23	20	21	6	10	15	11	13	3
COSUMNES RIVER	24	21	15	30	6	13	13	10	19	6
ANTELOPE VALLEY	14	16	17	20	6	10	12	12	15	5
WEST VALLEY	23	25	30	28	5	17	17	22	22	5
IMPERIAL VALLEY	9	14	12	13	5	7	12	9	10	3
COMPTON	6	6	8	10	4	2	3	5	5	2
MARIN	22	23	22	25	2	14	17	15	16	2
SAN DIEGO CITY	25	25	23	26	1	14	15	13	14	0
CHAFFEY	17	16	15	16	0	11	11	10	11	0
SANTA ROSA	32	30	34	31	0	20	20	23	22	2
MENDOCINO	19	18	15	18	0	15	13	14	16	1
SANTA MONICA	35	41	36	35	0	17	19	20	20	3
SAN BERNARDINO	8	7	9	7	-1	6	5	6	4	-2
Total	26	28	33	43	17	17	18	20	26	9

Share of first-time math students starting directly in transfer-level math by race/ethnicity

	Colleges that significantly broadened access			Rest of colleges			
	2015	2018	Change (pp)	2015	2018	Change (pp)	
Access (%)							
Latino	13	54	41	18	33	14	
White	24	63	39	32	48	16	
Asian American	46	78	32	49	59	11	
African American	13	51	39	14	27	12	
Total	23	61	38	26	40	14	
Difference in access (pp)							
White-Latino gap	11	9	-2	14	16	2	
White- African American gap	12	12	0	17	21	4	
White-Asian American gap	-22	-15	7	-17	-11	5	

TABLE E12

One-term throughput rate by race/ethnicity

	College bro	es that signi	ficantly ess	Rest of the colleges		
	2015	2018	Change (pp)	2015	2018	Change (pp)
Latino	8	26	17	10	17	7
White	17	39	22	21	32	11
Asian American	38	58	20	35	43	9
African American	7	22	14	7	13	6
Total	17	35	18	16	25	8
Difference in one-term throughput rates (pp)						
White-Latino gap	9	14	5	11	15	3
White-African American gap	10	18	8	14	19	5
White-Asian American gap	-21	-19	2	-13	-11	2

FIGURE E3

Annual change in the number of below transfer-level math sections offered



TABLE E13

Enrollment of college composition with co-requisite support

College Name	Enrollment	Scale (1)	Number of sections offered
ALLAN HANCOCK	183	12	7
AMERICAN RIVER	991	35	41
CABRILLO	452	29	16
CERRITOS	1,099	36	39
CITRUS	1,164	51	45
COALINGA	138	23	7
COSUMNES RIVER	219	12	12
CUYAMACA	296	36	9
EL CAMINO	282	10	9
FOLSOM LAKE	375	28	28
FULLERTON	306	10	11
GOLDEN WEST	236	16	8
GROSSMONT	282	11	8
IRVINE VALLEY	148	11	6
LEMOORE	135	17	13
LOS MEDANOS	755	48	25
MIRA COSTA	156	9	12
MODESTO	579	23	21
MORENO VALLEY	330	18	13
MT. SAN ANTONIO	1,326	25	46
MT. SAN JACINTO	218	7	9

NORCO	162	11	7
PORTERVILLE	167	20	7
REDWOODS	26	4	2
RIVERSIDE	62	2	2
SACRAMENTO CITY	420	21	20
SADDLEBACK	46	2	2
SAN DIEGO CITY	434	33	18
SAN DIEGO MESA	371	16	14
SAN JOAQUIN DELTA	391	14	14
SAN MATEO	481	47	18
SANTA MONICA	1,613	n.d.	62
SHASTA	77	7	3
SKYLINE	567	48	26
SOLANO	260	20	9
SOUTHWESTERN	114	4	5
Total	14,861	22	594

NOTE: (1) Enrollment in college composition with co-requisite support as a share on total enrollment in college composition.

TABLE E14

Gains in throughput of students in co-requisite courses relative to students in traditional developmental courses

COLLEGE_NAME	One-term throughput rate co-requisite students (%)	One-year throughput rate remedial students (%)	Gains in throughput (pp)
ALLAN HANCOCK	56	29	27
AMERICAN RIVER	63	28	34
CABRILLO	66	37	29
CERRITOS	67	34	33
CITRUS	61	36	25
COSUMNES RIVER	54	22	32
CUYAMACA	74	40	34
EL CAMINO	76	32	44
FOLSOM LAKE	57	37	21
FULLERTON	64	32	32
GOLDEN WEST	71	33	38
GROSSMONT	73	37	37
IRVINE VALLEY	80	44	35
LOS MEDANOS	68	35	33
MIRA COSTA	63	34	29
MODESTO	55	25	31
MORENO VALLEY	60	39	22
MT. SAN ANTONIO	48	30	18
MT. SAN JACINTO	46	34	12
NORCO	57	20	37

COLLEGE_NAME	One-term throughput rate co-requisite students (%)	One-year throughput rate remedial students (%)	Gains in throughput (pp)
SACRAMENTO CITY	66	27	38
SAN DIEGO CITY	77	45	32
SAN DIEGO MESA	75	42	33
SAN JOAQUIN DELTA	55	25	30
SAN MATEO	61	21	40
SKYLINE	64	30	34
SOLANO	65	29	36
Total	63	32	30

NOTE: Gain on throughput is defined as the difference between the one-term throughput rate of co-requisite students in fall 2018 versus the one-year throughput rate among first-time remedial students in fall 2017. Sample restricted to degree/transfer seeking students. Six colleges are excluded from this analysis because their cohort size was less than 100. "pp" symbolized percentage points.

TABLE E15

Enrollment in transfer-level math with co-requisite support

College Name	Subject	Fall 2018 enrollment
CUYAMACA	Applied Calculus	21
MIRA COSTA	Applied Calculus	46
MT. SAN ANTONIO	Applied Calculus	150
CRAFTON HILLS	College Algebra	130
MT. SAN ANTONIO	College Algebra	182
PALOMAR	College Algebra	56
CUYAMACA	Pre-calculus	102
FOOTHILL	Pre-calculus	180
MIRA COSTA	Pre-calculus	119
SANTIAGO CANYON	Pre-calculus	36
ALAMEDA	Statistics	133
CITRUS	Statistics	486
COLUMBIA	Statistics	31
CRAFTON HILLS	Statistics	182
CUYAMACA	Statistics	319
GLENDALE	Statistics	33
LOS MEDANOS	Statistics	339
MIRA COSTA	Statistics	190
SANTIAGO CANYON	Statistics	69



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